



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,170	04/02/2004	Heine Melle Mulder	081468-0309024	7878

909 7590 05/12/2006

PILLSBURY WINTHROP SHAW PITTMAN, LLP
P.O. BOX 10500
MCLEAN, VA 22102

EXAMINER

GUTIERREZ, KEVIN C

ART UNIT	PAPER NUMBER
----------	--------------

2851

DATE MAILED: 05/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/816,170	Applicant(s) MULDER ET AL.	
	Examiner Kevin Gutierrez	Art Unit 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-20 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's arguments, see Remarks, filed February 21, 2006, with respect to Drawings and Claims have been fully considered and are persuasive. The objection of the drawings and the rejection to the Claims under 35 USC 112 have been withdrawn.

2. Applicant's arguments filed February 21, 2006 have been fully considered but they are not persuasive. The Applicant states that Shinoda et al. '730 does not disclose, teach or suggest: "(1) an optical element configured to actually redistribute an intensity distribution such that the intensity distribution is asymmetric" and " (2) an optical element arranged to rotate an intensity distribution." The Examiner respectfully disagrees.

Regarding (1), the optical element (20) disclosed by Shinoda further inclines the intensity distribution by shifting the optical element ([0075], lines 6-7). Further, the pupil transmittance distribution reaches the substrate at an off-axis ([0083], lines 6-8).

Regarding (2), the optical element is capable of adjusting to a shift amount ([0076], lines 1-4). Therefore, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-4 and 13-17 rejected under 35 U.S.C. 102(e) as being anticipated by Shinoda (US 2003/0151730).

Regarding claims 1 and 13, Shinoda discloses

- “a reflective integrator (4) disposed along an optical axis of the lithographic apparatus, the reflective integrator having a rectangular cross-section perpendicular to said optical axis, the cross-section having sides parallel to mutually perpendicular X and Y axes ([0046], 3-5, where the shape may be of a four sided figure; and
- an optical element (20), constructed and arranged to redistribute an intensity distribution exiting the reflective integrator ([0075], lines 6-7) such that the intensity distribution is asymmetric with respect to at least one of the X and Y axes ([0019], last sentence; [0063], lines 6-8).”

Regarding claims 2-3, 14 and 17, Shinoda discloses “wherein said optical element is constructed and arranged to rotate an intensity distribution of a beam of radiation around said optical axis over an angle between 5 and 85 degrees ([0076], lines 1-4; [0082], lines 2-5).”

Regarding claim 4, Shinoda discloses “wherein said optical element (20) is disposed downstream of said reflective integrator (4) in a pupil plane of said illumination system ([0077]).”

Regarding claim 15, Shinoda discloses “wherein said angle is variable ([0082], line 7) and the optical element is set according to the value of said angle ([076], lines 1-3).”

Regarding claim 16, Shinoda discloses all of the claimed limitations and further discloses

- “an illumination system ([0041], last line) for providing a projection beam of radiation;
- a support structure ([0054], line 1) for supporting a patterning device (13; mask), the patterning device serving to impart the projection beam with a pattern of its cross-section ([0040], lines 8-9);
- a substrate table ([0057], line 4) for holding a substrate (15; plate);
- a projection system (14) for projecting the patterned beam onto a target portion of the substrate ([0055], lines 1-3);

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject

matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5-10 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinoda in view of Nakagawa et al (5,859,707).

Regarding claims 5, 7, 9-10 and 19-20, Shinoda discloses an optical element where it comprises of a glass plate, with an applied film, including plural members to control the light transmittance ([0017], lines 14-16). Shinoda does not disclose (claim 5, 9-10 and 19-20) wherein said optical element includes a plurality of pairs of reflective surfaces and (claim 7) “where reflective surfaces are coated mirrors.”

However, having “wherein said optical element includes at least two pairs of reflective surfaces” and “wherein reflective surfaces are coated mirrors” is known to the art as it is evident by the teaching of Nakagawa et al (col. 41, lines 51-54, where Nakagawa et al teaches a cold mirror comprising of a glass plate with a film for reflectance and transmittance light). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the optical element of Shinoda by having a glass plate have a film for reflectance and transmittance for at least the purpose to use a beam of measurement.

Regarding claim 6, Shinoda as modified further discloses “wherein a distance between the optical axis (fig. 1, dotted line) and said part of the intensity distribution upstream (p) of said optical element (20) is equal to said distance downstream (location of 20) of said optical element (20).”

Regarding claim 8, Shinoda as modified disclose “wherein said at least one pair of reflective surfaces are planar and parallel to each other so that a direction of a ray

of said beam of radiation upstream of said optical element equals a direction of said ray downstream of said optical element (the optical element 20 of Shinoda as modified by Nakagawa, comprising of reflective surfaces that are planar and parallel with the incident beam and transmitted beam traveling in the same direction).”

Regarding claim 18, Shinoda as modified disclose the limitations as set forth in claims 4 and 5 above.

7. Claim 11 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinoda in view of Nakagawa et al, as applied to claims 5 and 7-10, and in further view of Wynne Willson et al. (6,102,554).

Regarding claim 11, Shinoda as modified discloses all of the claimed limitations except “wherein said plurality of pairs of reflective surfaces includes radially extending and tilted mirror blades, the mirror blades including a reflective coating at both sides.”

However, having “said plurality of pairs of reflective surfaces includes radially extending and tilted mirror blades, the mirror blades including a reflective coating at both sides” is known to the art as it is evident by the teaching of Wynne Willson et al (col. 4, lines 40-43); claim 24, where the blades are substantially positioned in the same plane and have reflective surfaces). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify the optical element of Shinoda as modified by including mirror blades with reflective

coatings for at least the purpose of utilizing the reflected beams as a distance measurement.

Allowable Subject Matter

8. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is an examiner's statement of reasons for allowance: the prior art does not disclose or teach nor render obviousness "wherein a thickness of said mirror blades varies as a function of distance from the optical axis and as a function of angle around the optical axis" in combination with the rest of the claimed limitations.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following disclose an optical element to modify intensity distribution of an illumination system: Dieckmann et al. (US 2003/0030780) and Antoni (US 2002/0075468).

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Gutierrez whose telephone number is (571)-272-5922. The examiner can normally be reached on Monday-Friday: 7:30 a.m. - 4:30 p.m..

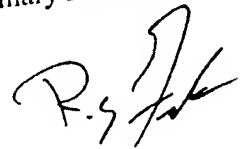
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571)-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin Gutierrez
Examiner
Art Unit 2851

Monday, May 08, 2006

Rodney Fuller
Primary Examiner

A handwritten signature in black ink, appearing to read 'R. Fuller', with a stylized flourish at the end.

2/11/06
 5.9.06
 1/21



Replacement Sheet
 U.S. Appn. No. 10/816,170

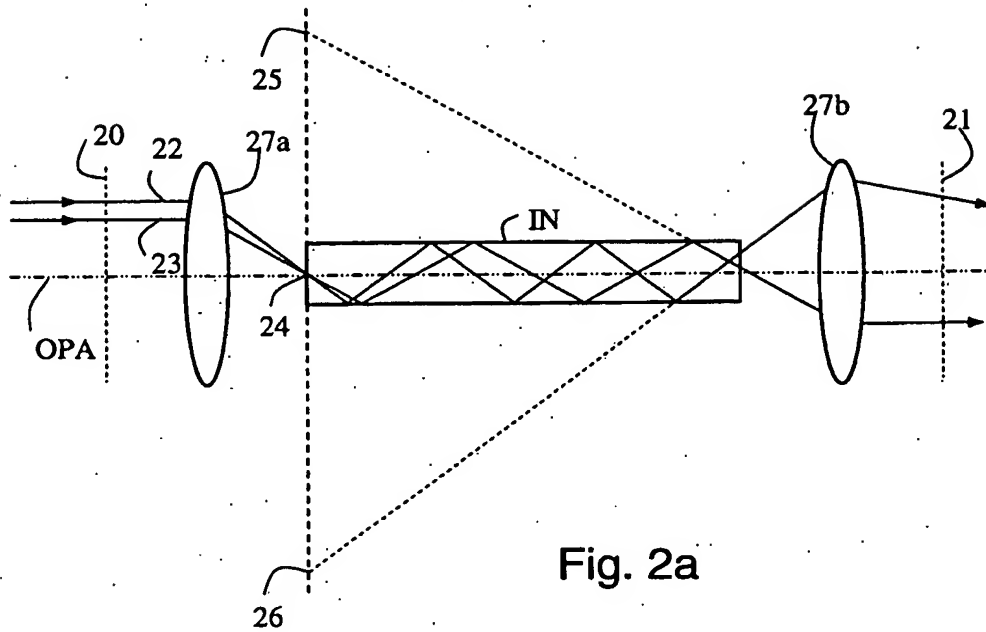


Fig. 2a

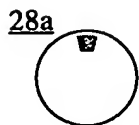


Fig. 2b

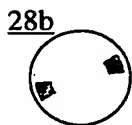


Fig. 2c

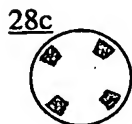


Fig. 2d

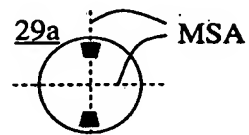


Fig. 2e

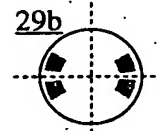


Fig. 2f

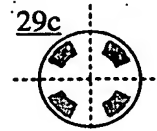


Fig. 2g